The Journal of Documentary Reproduction

SEPTEMBER • 1941

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Reflection Copying

Simplified Book Cradle

Object Lesson for Libraries

Portable Microfile Recordak, Model E

Volume 4 • Number 3

A QUARTERLY REVIEW OF THE APPLICATION OF PHOTOGRAPHY AND ALLIED TECHNIQUES TO LIBRARY, MUSEUM AND ARCHIVAL SERVICE

THE JOURNAL OF DOCUMENTARY REPRODUCTION was established to meet a need for an independent, critical, impartial periodical in this field, and is published on a cooperative nonprofit basis. It deals with problems confronting scholars, scientists, archivists, librarians, editors and other concerned groups. The JOURNAL, in attempting to meet this need, urges other periodicals to continue disseminating helpful news concerning scientific aids to learning, and seeks their cooperation, as its editors and publishers are motivated only by the spirit of scientific inquiry and service to scholarship.

The Editorial Board is assisted by members of several organizations interested in the scope of a professional periodical devoted to the use of photography and related processes in reproducing materials in print and manuscript form. Improvements and new procedures are appearing so rapidly that a central source of information is essential, particularly if science and scholarship are to receive the greatest benefits from the application of these means to definite educational ends.

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THE JOURNAL OF DOCUMENTARY REPRODUCTION

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An Object Lesson for Libraries

L. BENDIKSON

THE PRESIDENT of the Royal Photographic Society of Great Britain, F. J. Mortimer, F.R.S.A., opened his presidential address with the remark: "When this country entered the present war in September 1939, the effect on many phases of life was problematical, but among familiar activities, photography demonstrated that it had probably more useful applications than any other science." Enumerating the various phases of photography's part in the war, Mr. Mortimer states: "In record work the camera has taken a very high place in the circumstances brought about by the present conflict. Historic buildings have suffered in many of the British cities, and documents contained in these buildings have been destroyed. Where they have been recorded by the camera, the photographs will at least serve as a certificate of the fact of their existence to a future generation."

Now let us see what the latest reports about library losses in England tell us about the extent of the damage done. From incomplete records available for losses to the middle of February, it is evident that destruction has assumed heavy proportions. From library after library come reports of premises ruined and collections destroyed; the number of books lost through direct bomb hits, through fire caused by incendiaries and through water damage, is large. From a preliminary survey, published in a special supplement to *Bulletin from Britain,* no.36, of May 7, 1941 we have accumulated the following summary:

University of London, King's College and University College.

Egyptology collection, badly damaged by water. Mocatta Library and Museum of Anglo-Judaica, shattered by incendiary bombs and some 100,000 books destroyed; likewise an additional 7000 books, placed for safekeeping elsewhere.

London Public Libraries.

One of the largest individual collections of books destroyed in London was that at the *Guildhall,* where 25,000 volumes were destroyed. *Hinet* Public Library in Camberwell, 20,000 books consumed by fire. The Central Reference room in *Hampstead* completely destroyed, with a loss of 15,000 books and 10,000 ruined by water. The *West End Branch* lost 8000 volumes by fire. *Bethnal Green's* Central Library, 4300 volumes destroyed. Severely damaged were also the *Mill Hill Branch* Library at Hendon and the Public Library of *Richmond.*

FIG. 1. Ruins of London University College Library

Manchester.

The Library of the Literary and Philosophical Society was completely destroyed with a loss of 50,000 volumes.

Birmingham.

The Library of the Natural History and Philosophical Society, completely burned.

Portsmouth.

With one exception, all the Public Libraries have heen damaged by air-raids. The *Carnegie Branch Library* lost 5000 books.

I have quoted the presidential address of Mr. Mortimer, as well as the preliminary report, contained in Bulletin no.36, about the de-

struction of libraries in England, with reference to a previously written article, "The Need for Safety Measures," as published in the JOURNAL OF DOCUMENTARY REPRODUCTION, of December 1939, and written about the time England became involved in war. The "remote possibility" that this war might spread to the United States, as repeatedly emphasized by some about that time, has lost its remoteness of two years ago to a considerable degree, and it is with a great deal of concern that it might be asked, what has been done in the elapsed period of grace?

Lack of preparation for defense in emergencies has been the cause of appalling losses at every turn, and at this present moment we live here in an officially proclaimed unlimited state of national emergency. As far as I know, very little has been done to safeguard documents and records against large scale destruction, while this should be the time that the cameras should be working to full capacity, in an already belated effort to duplicate these documents and records of historical and economical importance, in a systematic effort and in orderly, well organized fashion, and not in the last minute hasty scramble of a *sauve-qui-peut.*

Through some agency, geographic areas should be established, each comprising a number of libraries, which should forward, as safely as possible, successive portions of selected material to a central point within that area, where rapid reproduction on standard 35mm. film could be undertaken, and returned with the originals within a few days.

And if, after all, such precautions in many instances might have been superfluous, not a single dollar spent for this insurance measure will be lost, because the available film reproductions could be used in other localities for consultation and for study. And they will be used to good advantage, in the same manner as the 20,000 photostats (not counting an even larger number of film reproductions), dispersed during the past three years over numerous libraries in this country, by the Huntington Library of its rarest works, in pursuance of a policy to make its rare materials available to other libraries.

Use of Microphotography in University Libraries*

MAURICE F. TAUBER

EVER SINCE the Richmond Conference of the American Library Association in 1936 the possible uses of microphotography in scholarly libraries have been discussed at length in the professional literature. Among the more important uses which have been claimed for microfilms are the following: (1) to secure materials which are difficult or impossible to obtain because they are unique, out of print, costly or rare; (2) to provide copies of materials which are in the process of disintegration, particularly wood-pulp newspapers, old manuscripts and documents of various kinds; (3) to reduce congestion in the stacks of libraries by reproducing bulky materials on film; (4) to publish and disseminate research materials in single copies or in multiple editions. In addition to these uses, it has been shown that microfilming may be a valuable technique for producing institutional union catalogs and duplicating card catalogs, for reducing the handling of irreplaceable materials, for completing special collections of runs of periodicals, for facilitating the exchange and loan of dissertations and other scholarly materials, for recovering lost and obscure texts, for storing little-used or obsolete materials, and for implementing general classroom instruction.[1]

*Based upon data collected by the author during visits to 33 university libraries in the United States, 1940-41. List of institutions visited: Harvard University, Yale University, Brown University, Columbia University, New York University, Fordham University, Rutgers University, Princeton University, University of Pennsylvania, Temple University, Johns Hopkins University, George Washington University, Georgetown University, University of Pittsburgh, University of Chicago, Northwestern University, University of Colorado, University of Denver, University of Washington (Seattle), University of Oregon, Oregon State College, University of California, University of California at Los Angeles, University of Southern California, Stanford University, University of Arizona, University of Alabama, Tulane University, Louisiana State University, University of Texas, Ohio State University, Vanderbilt-Peabody (Joint University Libraries), and the University of Virginia. A future article will consider projects in institutions which had not been visited at the time of writing.

[1]Cf. L. M. Raney, "University of Chicago Exhibition," *Journal of Documentary Reproduction*, III (December 1940), 229-31.

These possible uses of microphotography in university and other types of libraries are not theoretical formulations of writers and sponsors of photographic methods. Most of them have been put into effect in libraries. Projects utilizing the photographic technique for some of these purposes have been described in issues of the JOURNAL OF DOCUMENTARY REPRODUCTION and in other journals. Data recently acquired from a group of university libraries indicate current progress in the application of this new technique.

As a group, librarians have been rather cautious in their adoption of photographic techniques. Some librarians who have admitted the values of microfilms have been unwilling to introduce the technique into their libraries, even though newspaper files may be disintegrating, or storage space may be at a premium, or gaps may exist in important periodical files, or rare items remain in the desiderata file. Other librarians, however, have translated theory into practice in order to solve pressing library problems, to acquire materials, to aid scholars and to implement instruction. In the following paragraphs, consideration will be given to some of the projects which have actually been put into effect in university libraries. It is not an exhaustive study of all projects in all university libraries, but rather a description of a few of the projects in an attempt to answer the following questions: Is microphotography actually being used by librarians to fill in gaps in their collections? Is microfilm being used in lieu of interlibrary loans? Is microphotography being used for storage purposes? Once the films have been acquired, are they used for instructional purposes by faculty members and for research purposes by students? A final question, closely related to the amount of use, refers to the mechanical handling of film. Have students and faculty members been able to use the film in reading machines without difficulty and without damage to the films?

It is evident that most of the projects in university libraries have been concerned with the acquisition of materials. The possibility of using microfilms to secure materials which have long been out of print, or which are too expensive to purchase, is best illustrated by the project, "English Books Printed before 1500." It is an excellent example of library cooperation in reproducing materials which none of the libraries could buy in the originals even if it had the opportunity to do so.

In the first place, what sort of materials on microfilm have libraries been acquiring? In such institutions as Harvard, Yale, Chicago, Columbia and Washington (Seattle), among others, definite attempts are being made to fill in gaps in collections and to acquire items which have been on desiderata lists. Probably one of the largest collections of films has been assembled by the University of Chicago Libraries, which has approximately 250 titles comprising over 1100 volumes or items, exclusive of short strips and films of volumes of newspapers. One is struck with the time period covered by the items, as well as by the range of subjects. Although fifteenth, sixteenth and seventeenth century items are included, it is clear that eighteenth and nineteenth century materials predominate. A few out-of-print materials of the twentieth century are also included in the collection. If the materials are broken down by subject, it is found that literary, historical and theological items are most prominent, although philosophy, economics, science, philology, psychology, agriculture, political science, sociology, librarianship, and military science are represented. A few examples, selected at random, are as follows: *Game at Chess* (1474), Timothy Bright's *Characteristie* (1588), Richard Corbet's *Certain Elegant Poems* (1647), John Hall's *Emblems* (1658), *Journal de l'Assemblée Nationale* (1791-92), *La Bouche de Fer* (1791-92), J. N. Cardozo, *Notes on Political Economy* (1826), and Maurice Sceve, *Microcosme* (1928). The University of Chicago Libraries have also made extensive uses of microphotography in the acquisition and preservation of newspaper files. The examination of a list of films such as that of the University of Chicago Libraries leaves no doubt as to the possibilities of acquiring films for research work.

The same conclusion may be drawn when the University of Washington (Seattle) list of microfilms of about 100 titles, comprising about 225 different items or volumes, is analyzed. Materials bearing seventeenth, eighteenth and nineteenth century imprints are in evidence. A wide range of subject fields is also present. Only through microphotography was it a simple matter to secure copies of Robert Greville's *The Nature of Truth* (1640) or G. F. Loredano's *Berenice* (1601). Such titles as A. C. Anderson's *History of the Northwest Coast* (1878), W. A. Bell's *Settlement of Seattle* (1878), Jesse Applegate's *Views of Oregon History* (1878), A. L. Bancroft's *Diary of Journey to Oregon* (1862), *British*

Columbia Sketches (1878), Peter Puget's *Log of the Sloop "Discovery"* (1791-93), and Riley Root's *Journal of Travels from St. Joseph's to Oregon* clearly show how microphotography is a practical means for building up a complete collection of regional materials.

A number of libraries, of course, have obtained copies of films produced on a subscription basis, such as the NRA and AAA hearings, the *Maryland Gazette,* foreign newspapers (filmed under the supervision of the Harvard University Library), etc. But it must be admitted that few have gone beyond that. Only a handful of libraries, for example, have introduced microphotography for acquisitional purposes to the same degree as Brown University.

Using its own microphotographic laboratory, Brown University is employing the film technique in the following ways: (1) to complete the mathematical library at Brown, (2) to duplicate music scores, (3) to reproduce materials from expensive and rare books—subject to copyright restrictions—needed for considerable handling by large numbers of students, (4) to build up the Harris Collection of American Poetry, (5) to reproduce items in Medina's *Biblioteca-Hispano Americana, 1843-1900* in an effort to strengthen the Latin-American collection, (6) to acquire materials, particularly theses, in lieu of interlibrary loans, and (7) to develop a collection of foreign newspapers without becoming overwhelmed by the bulk of such publications.

Definite programs for using microphotography for acquisitional purposes have been organized by Princeton, Texas, California, Michigan, Vanderbilt-Peabody, Fordham, Temple, and Virginia. For example, Princeton is engaged in filling out its collection of French plays by acquiring film copies of items which are not on the book market. Items which have long reposed in the desiderata files have thus been acquired.

The University of Texas project of microfilming materials for Southern history has already been reported in the JOURNAL OF DOCUMENTARY REPRODUCTION by B. F. Lathrop.[2] Lathrop spent two years microfilming materials in Southern history, 1820 to 1880, located in public, historical and society libraries in various parts of the country. Financed by the Bureau of Research in the Social Sciences of the Littlefield Fund for

[2] *Journal of Documentary Reproduction,* II (June 1939), 91-108.

Southern History, the project was conducted in cooperation with the University Library.

Similarly, the Bancroft Library of the University of California has used microphotography to reproduce historical materials. One of the important features of this project has been the plan to copy manuscript materials owned by this library to prevent their damage through intensive and frequent use by students and research workers.

The project involving the reproduction of all known English legal treatises printed before 1600, carried on at the University of Michigan Law Library, has been described by Coffey, in an article in the *Law Library Journal,* XXXI (1938), 252-58. As in many other cases of film projects, positive copies are available to suscribing libraries. Another project involving legal materials is in process at the University of Chicago Libraries, Department of Photographic Reproduction. Seven law libraries have subscribed to film copies of the *United States Supreme Court Briefs* which the laboratory is reproducing.

The Vanderbilt-Peabody Joint University Libraries new building will contain quarters for a photographic laboratory. The present photographic policy of the library has been concerned primarily with the collection of census reports for the South, and the reproduction of church records and family papers. Snch acquisitions are expected to furnisb easy access to primary source materials for research in the history and culture of the South.

How a young library without sufficient resources necessary for instruction and research can use microfilms satisfactorily is illustrated by the activity of Fordham University. An extensive series of manuscripts in medieval philosophy, theology and history have been reproduced for faculty members, who use the reproductions for instructional purposes, and for graduate students and research workers, who employ them in their work in dissertations and special studies.

The Temple University Library, also deficient in basic research materials, has been utilizing microphotography in building up its periodical collection. Using its own laboratory, Temple has been adding periodical volumes to its holdings by borrowing and filming originals held in various libraries in the Philadelphia area.

The University of Virginia, likewise using its own photographic

laboratory, has been adding several thousand archival items to its collections. Privately owned papers of families and companies have been borrowed and filmed. Gaps in runs of journals, particularly those which pertain to Virginia and other parts of the South, have also been filmed.

Regional library cooperation in the purchase of microfilm titles has been undertaken in several instances. An illustration of this cooperation is the purchase of the films for "English Books Printed before 1500" by two or more libraries. A more recent example of cooperative purchasing of films is the plan of the University of Colorado and the University of Denver. The University of Denver did not purchase the films in the American Periodicals Series and the American Culture Series made by University Microfilms because Colorado was subscribing to them. It is also planned that the University of Denver will secure the films of Latin American materials produced at Brown, while Colorado will obtain those made by the cooperative project at Duke, North Carolina and Tulane. It seems that libraries may well cooperate in purchasing films when they are relatively expensive and are not likely to be used intensively.

It should be apparent that many of the items secured have fulfilled the requests of faculty members and students for interlibrary loan service. Practically every institution visited has at some time secured films of materials for their patrons, rather than borrow the originals on interlibrary loan service. Service to individual faculty members in some institutions which may or may not have photographic laboratories of their own is carried on extensively. Harvard, Yale, Columbia, Princeton, Northwestern, Chicago, California, Ohio State, Pennsylvania, Virginia, Washington, and a number of other institutions use microphotography to acquire materials needed for individual research. In some instances the films are later turned over to the libraries; in others, they are retained by the faculty members. At the University of California at Los Angeles a special fund is spent on reproducing materials for individuals or teaching departments. The films remain in the departments concerned until the immediate values of the films have been satisfied. They are then transferred to the library for permanent care. Despite these instances of using films instead of interlibrary loans, it must be

said that borrowing of originals is still the prevalent practice, except for those items which are rare and fragile.

Although the great possibility of using microfilms to solve problems of storage has been recognized by librarians, little actually has been done along this line. In many instances, of course, no pressing problems of congested stacks have necessitated filming for storage purposes. In libraries which do have such problems, the librarians as well as the faculty members generally are reluctant to transfer textual matter to film and then discard or segregate the originals.

Films have been used for instructional purposes in the fields of music, medicine, biology, zoology, physical education, anthropology and library science. Reproductions of illustrative materials, however, rather than textual photographs comprise the major parts of most of the instructional films. Motion pictures, of course, have been used in many academic courses. According to the testimony of the librarians in the institutions visited, the amount of actual use, excluding newspaper use, has not been great. There are several exceptions to this in the larger university libraries. The nature of the use in all libraries, however, has been important. A limited number of faculty members and students have found recourse to films indispensable in research, and both time and money have been saved by employing microphotography. Nevertheless, an individual who requires the temporary use of a special collection or old newspaper files is generally better served by visiting the library owning the collection or files rather than having his library reproduce the entire set of materials. Microphotography is useful in situations of this kind when adequate indexing of materials is available.

So far as the actual handling of films in reading machines is concerned, some difficulty has been encountered. The experiences of the New York Public Library [3] and the Yale University Library indicate that special attendants are necessary to load the machine, to show the uninitiated reader how to use the machine, and to remove the film after use has been completed. Until this was done, frequently the film was damaged when the patron placed the film over the pressure plates instead of between them. Some tearing has also resulted from inexpert handling. Unless the user has had some experience with handling film,

[3]Correspondence from Mr. Ralph H. Carruthers.

the most effective procedure seems to require an attendant. This does not discredit present technique and equipment. When a university library has built up an extensive film collection and sufficient demand has been created, the appointment of a full-time attendant to supervise the mechanical handling of film will probably follow. Columbia University Libraries have set the pace with a separate Microfilm Department. The University of Virginia and Yale University, as well as several other iustitutions, provide special facilities for users of film.

This brief survey indicates in a concrete way that a growing number of librarians have utilized microphotography, although it has been primarily for acquisitional purposes on a research level. Doubtless this is the most important use of microphotography. In many instances materials have been gathered by film, rather than through borrowing originals on interlibrary loan. Little has been done in the solution of the problem of storage by microphotography in the group of libraries visited. In most cases, the problem is not yet a pressing one. That university librarians should maintain caution in introducing microphotography to solve some of their bibliographical and administrative problems is perhaps to be expected. But many librarians have been exceedingly overcautious in this respect. Microphotography itself has not bogged down, as Smith[4] suggests, but librarians as a group apparently cannot be aroused from their state of inertia. The possibilities of other means of reproduction have given some librarians reason for pause. Photostating continues to be an efficient method of reproducing a short run of pages. The Readex Microprint, which is distinctly an edition process, is being carefully watched by university librarians for its applications to their work. This method, it may be noted, does not provide copies on demand for continuous reproduction whereas microphotography does. It seems fairly certain that large projects of microphotography will increasingly use the microphotographic technique. When materials which are otherwise unavailable can be secured through microphotography at a cost which is equivalent to the cost of an ordinary trade book, it merely indicates good business sense on the part of librarians to avail themselves of the technique.

[4] X. P. Smith, "A Microfilm Survey," *Journal of Documentary Reproduction*, III (December 1940), 243.

Microphotography in European Libraries*

ADELE KIBRE

My first knowledge of the growth and possibilities of microphotography was obtained in the Vatican Library, in 1934, when I acquired the habit of visiting the photographic studio in order to observe philologists, palaeographers, and art historians rapidly filming their research materials with miniature cameras (Leica, Contax, or Rolleiflex). The official photographer did not provide microfilm service as demands for it were rare.

Research on my specialty, mediaeval writing and art centers, brought me to Berlin in the autumn of that year. There, in the Preussische Staatsbibliothek, my new Contax camera was initiated, for the photographic department had no microfilm equipment. A similar situation prevailed in all the other German libraries included in my odyssey during the subsequent months: Leipsic, Wolfenbüttel, Munich, Cassel, Darmstadt, Würzburg, Heidelberg, Carlsruhe, Zuickau, Cologne, etc. The following countries also offered no exception: Austria, Switzerland, Belgium, France, Holland, England, and Italy, where throughout 1935, I examined and filmed manuscripts for Professor Beeson of the University of Chicago. The individual researcher, whose work required copying of books or manuscripts scattered far afield, was dependent upon his own portable apparatus.

Suddenly, in the summer of 1935, the United States evinced symptoms of microfilm activity. A publishing company, Edwards Bros., of Ann Arbor, Michigan, had conceived a project to film all English books published prior to 1550 (now extended to 1640), and to this end, a member of their staff, Mr. Eugene B. Power, brought over to the British Museum a microfilm machine which he himself had constructed. Furthermore, in pursuance of his plan to deposit a series of microfilm

*Summary of a paper presented at the meeting of the American Library Association, Boston, Massachusetts, June 23, 1941.

cameras in European capitals which would be available for quantity reproduction of research materials, he solicited and obtained the cooperation of the Bibliothèque Nationale in Paris, the Spanish State Library Association (delivery of a machine to Madrid in accordance with the agreement delayed by the Revolution), and the Vatican Library (a Graflex camera deposited here in 1936). The Direction of the Preussische Staatsbibliothek in Berlin preferred to entrust the filming of their manuscripts and printed books to Photo-Copie, a local private firm, whose recently constructed microfilm apparatus appeared adequate.

The University of Chicago's "Demonstration of Microphotography" at the Paris International Exposition of 1937 revealed the high development in American mechanized equipment (latest innovations in European cameras and reading machines [Zeiss] were exhibited at the meeting of the International Federation of Documentation in Zürich, shortly before the outbreak of war).

Changes from 1935 were obvious in 1938, when I examined and filmed with Contax and Leica manuscripts for Dean McKeon, University of Chicago, in England, Holland, Belginm, and France.

At the British Musenm, the Graflex and Kodak Microfile, both deposited by Mr. Power, now of University Microfilms, were functioning. As in previous years, visiting-scholars (also private photographers) could film in the Studio on payment of small fee which included use of dark rooms. The Oxford University Press (operating a Graflex, Power deposit) was in charge of microfilm service (as of all other photographic reproduction) at the Bodleian Library, whither research materials from the various Oxford colleges, all without equipment, could be sent for filming. In Cambridge, microfilm facilities existed only at University College (Graflex camera, of their own purchase); here, and also at Corpus Christi, readers were not permitted to photograph save in exceptional cases. A local private photographer, long since a tradition in Cambridge, was available with Leica camera for the other College libraries; the visiting-scholar could also where possible make his own film-copies. Furthermore, two private firms in London, operating with Graflex and Leica, were sending photographers to various parts of Great Britain—Cathedral Libraries, Private Collections, etc.—and to Ireland. Arrangements might also be made by the researcher, if not

prepared to do the work himself, for the filming at the British Museum of scattered and far-removed desiderata.

In Holland, microfilm equipment (Graflex and Leica) was limited to a few private photographers in The Hague and Amsterdam. Shortly before the outbreak of war, the State Library of Leyden agreed to accept a machine from Mr. Power.

The Royal Library of Brussels contained one of the most complete photographic studios on the Continent, equipped with Leica and enlarging apparatus for microfilm; the photographer in charge also ranked with the ambitious minority who had made successful experiments in the color reproduction of illuminated manuscripts. In addition, this studio was unique, outside of Germany, in operating a Siemens machine (a similar machine was also recently acquired by the Vatican), which makes "black on white" copies directly, thereby furnishing a solution to the not-infrequent academic request for "film and enlargements" of several hundred folios or pages, distributed over an almost equal number of manuscripts. Such orders were in the past relegated to the rotograph or photostat. While generally not encouraged to photograph in the Royal Library, the visiting scholar had to rely on his portable equipment in other Belgian libraries (Namur, Liège, Bruges, etc.), or else arrange for the filming of his research materials in Brussels.

The Bibliothèque Nationale in Paris, whose executive secretary, M. Emile Leroy, had long been an active participant in microphotography, was well equipped with a Seidell camera and a Graflex, gift of the Rockefeller Foundation; books and manuscripts from other Parisian and provincial libraries, none of which had microfilm facilities, could also be filmed here. Readers and private photographers, as in the past, were permitted to use their own apparatus which was almost imperative in the case of the smaller communal libraries: Amiens, Boulogne, Avranches, Douai, Troyes, Laon, etc. Very valuable manuscripts are conserved in these libraries, and librarians refuse to send early or illuminated manuscripts to Paris.

During the summer of 1939, I observed the microfilm situation in Hungary and Germany. Trips to Roumania and Denmark, which were included in my itinerary, had to be cancelled at that time. However, from correspondence with the Royal Library in Copenhagen, and Alba

Iulia, Roumania, I can affirm that microphotography depends here on the visiting-scholar. This proved true at the Landesbibliothek of Budapest and elsewhere in Hungary.

In Vienna, the National Library was operating a Leica (short filmstrips of 36 exposures), but readers preferred to take photographs themselves and the spacious sunny room available for this purpose was tempting.

Generally speaking, photographic reproduction in miniature showed definite progress in Germany. The previously mentioned private firm Photo-Copie took film orders, and was scheduled to serve as the central station in a vast government scheme whereby all German libraries were to he outfitted with microfilm apparatus as a means of eliminating interlibrary loans. A camera had already heen installed by Photo-Copie in the Preussische Staatsbibliothek (Berlin). The Bayerische Staatsbibliothek at Munich (where incidentally I experienced the outbreak of war and joined in an air raid rehearsal) was equipped with the Leica. Readers also filmed in the photographic studio. By the end of August, rare manuscripts and books had been evacuated.

It was a relief to find library collections still accessible in Italy, on my return in late September 1939. Here the researcher must do his own film-copying, for not a single Italian library, excluding the Vatican, has microfilm facilities.

At the Vatican Library, the Graflex has been in active service since 1936. The photographic studio, no longer a private venture, prefers to undertake all film orders, thus allowing the visiting-scholar his entire time for research. The acquisition of a Siemens camera has already been noted, and it is the postwar hope of the Prefect, a pioneer in microphotography, to install a large stationary microfilm machine. Samples of Vatican photography are now on display in a permanent exhibition at the entrance to the Library.

It is worthy of comment here that the original plan of sending the Graflex with a Vatican operator to various parts of Italy did not prove practical. Furthermore, interlibrary loans, while possible between National and University Libraries, are not a regular procedure between the latter and the Vatican Library.

A cable from the University of Chicago in December 1940, with sug-

gestive orders to film certain manuscripts in Switzerland, afforded the welcome chance of obtaining information on microphotography in that country. My itinerary included Bâle, Bern, St. Gall, Einsiedeln, and Zürich. However, with the exception of Bern and Einsiedeln, I found the entire collections not everywhere accessible. The famous Benedictine library at St. Gall was stripped of its treasures and deserted. In Zürich and Bâle, all the valuable manuscripts and rare books had been evacuated.

Microfilm facilities exist only in two libraries: at Bâle (Universitätsbibliothek) and Bern (Stadtbibliothek); visiting-scholars are also permitted to use their own apparatus. The very efficient photographic laboratory of Bâle is equipped with the Leica (film rolls of 250 exposures). A miniature Zeiss camera for microfilm or photostats is operated by the Bern photographer, a professor of history, whose hobby is the studio. The Zentralhibliothek of Zürich has in the past relied upon a local private firm which makes film copies in its own laboratory; "for the duration," however, none of the still accessible books or manuscripts can be sent out of the Library.

Unbroken communications with English, Belgian, Dutch, Hungarian, Danish, and German libraries permit me to state that tbe microfilm situation has not changed since 1938 and 1939. Tbe same may also be concluded for Spain. While on a hurried trip to Paris in June 1940, I snatched (after an air raid) a final glimpse of the Bibliothèque Nationale and its photographic department. The latter, with two Seidell machines, special infrared and ultraviolet apparatus, etc., rates in the judgment of the writer as the finest on the Continent.

Portuguese libraries were visited last March, when I awaited passage to the States. The National Library in Lisbon has the Leica (film strips of 36 exposures). Readers may also photograph. Elsewhere equipment is nonexistent. Fortunately all the collections are available, and library hours ideal (half-past eleven until four or five in the afternoon).

Two current microfilm projects, one French, the other American (war-born) deserve mention here.

"L'institut d'histoire des textes" which was founded in Paris about 1937 thus formulates its main goal: "to study the history of the written transmission of human thought." The textual history of the Classical

Authors constitutes the immediate aim of the first phase of the work, which is centered on the creation in Paris of a photographic library comprising all the extant Classical manuscripts. The various "collaborateurs," outfitted with Leica cameras, have frequently been encountered; their particular job is to search for Classical (at present Latin) manuscripts, to date, describe (inventory of material characteristics: size, gatherings, etc.), and to film them—*in toto* if prior to saec. xiv; sample pages, usually, of Renaissance codices). Enlargements kept to uniform size are made for the most part in Paris, mounted on sheets, and bound in volumes. The administration of this project is by Mlle. Jeanne Vielliard. The director, M. Félix Grat, unfortunately lost his life in the early months of the war.

In January 1941, under the auspices of the American Council of Learned Societies and the Library of Congress, with an initial grant from the Rockefeller Foundation, there came into being the project for quantity filming of research materials in foreign depositories. Its immediate task is the emergency filming of manuscripts in Great Britain; the selection of materials has been entrusted to a committee consisting of Dr. H. A. Kellar of the American Historical Association (chairman), and the Secretaries of the Modern Language Association and the Mediaeval Academy. Plans are envisaged for similar work in other countries as opportunity offers. The filming, under the direction of Mr. Power, is already in action, with six operators and cameras in the evacuation stations (bomb-proof coal mines). The initial order which includes some 14,000 manuscripts (5000 are being filmed at Bodleian) from everywhere in the British Isles is impressive; e.g., Lambeth Palace, Westminster Abbey; Cambridge; Cheltenham; Rylands Library (Manchester); York, Salisbury, Durham, and other Cathedral Libraries. Prewar accessibility to some of the private collections not infrequently involved difficulties: scholars need not he reminded of Thirlestaine House, Cheltenham. Negative films will he deposited in the Library of Congress, cataloged, and positive copies placed at the disposal of researchers.

This project illustrates the truth of a comment twice made to me by a distinguished librarian and scholar after his return from two visits to the United States: "The moment I stepped off the boat, I realized that in one year you in America accomplish what it takes us in Europe ten years to do."

The Cost of Microfilm Copying in Libraries

ATHERTON SEIDELL

In a recent discussion, "The Place of Microfilm Copying in Library Organization" [1] it was suggested that libraries eventually might be able to undertake microfilm copying for research workers at no greater expense than is now incurred in providing ordinary services to readers and borrowers. It was mentioned at the time that since this detail of library operation is so intimately bound up with many others, accurate cost estimates are not available. For this reason the minimum cost at which microfilms will have to be made to avoid increasing unduly the expense of library operation cannot definitely be fixed. All that is possible at present is to give an approximate estimate of the cost of making microfilms and to permit librarians to judge whether this is sufficiently low to enable them to take advantage of this new method of placing their collections at the disposal of an ever widening circle of patrons.

Since interest on the capital invested in libraries and their furnishings is not considered a legitimate part of operating expense, it may be assumed that the cost or amortization of microfilm equipment should not be considered a part of its operating expense. This equipment should be donated or paid for by other than microfilm operation.

For the information of those who may wish to know approximately how much such equipment costs, it may be mentioned that a microfilm camera for ordinary books and manuscripts but not for newspapers can now be purchased for about $350 and the required accessories for developing for about $150. It will of course be necessary to provide a dark room with running water, sinks, tables, etc., and in cities where the summer temperature of the water supply exceeds 75

[1] *Science*, XCIV (August 1, 1941), 114.

degrees, a cooling system should be installed. The cost of these items will vary greatly but certainly need not exceed $500 and it may safely be stated that a gift of $1000 will pretty well cover the cost of everything needed by a library for microfilm copying.

Experience so far has shown that the most expensive item of microfilm operation is keeping and collecting the accounts for the work done. Since this would not enter into a service operated gratuitously, it will not be discussed in the following estimate of the cost of microfilm copying.

For convenience the several operations involved in such a service may be divided into: (1) materials; (2) obtaining the books from the shelves and replacing them after use; (3) photographing the desired pages; (4) developing the exposed film; (5) verifying the microfilm copies; (6) delivering the finished microfilms.

Since it is most economical to fill microfilm orders in groups, the following estimate is made on the basis of copying, at one time, 100 different articles published in 100 different bound or unbound periodicals. This may seem to be a larger number than would ordinarily be called for, but is certainly not more than will eventually be needed when such service is fully utilized by those engaged in research.

1. The length of film required for copying 100 articles averaging 15 printed pages, and allowing for wastage, is estimated to be 120 feet. The price of ordinary positive 35mm. moving picture film in 1000 foot rolls is $12.50. The estimated cost of chemicals used in developing 120 feet of film is 25 cents. The materials for 100 microfilms would, accordingly, cost $1.75.

2. The time required to locate and deliver to the camera 100 books from the shelves of a large reference library is, of course, quite variable. It will depend upon many factors such as accuracy and completeness of the references, the system of classification, the arrangement of the stacks, the capability of the employees, the method of charging, etc. An estimate based upon experience in the Army Medical Library is that an average of two hours is required to find and transport 100 books to the camera, and one hour to replace them on the shelves.

3. The operations involved in photographing the pages of books include loading the camera, placing the book in proper position,

adjusting the focus, turning pages and removing the hook from its holder under the camera. The average time required for 100 articles, including retakes in cases where mistakes are made, is four hours.

4. The capacity of the camera used by Medicofilm Service is 150 feet, but the metal spiral upon which the film is developed holds only about 100 feet. Hence for 100 articles totaling 120 feet of film it is necessary to develop more than once. The time consumed in developing a roll of films—including all preparatory steps such as mixing the stock, developing and fixing solutions, pouring them into the trays and replacing in the bottles, washing the developed film and transferring it to the drying drum—is about one hour, or an estimated average of one and a half hours per 120 feet of film.

5. The verification includes comparing the film copy with the original and then cutting it into pieces corresponding to each article. These are each attached to the order blank upon which the reference to the article is written. Experience has shown that approximately three hours are required to verify 100 microfilm copies.

6. The 100 microfilms attached to the order hlanks bearing the names of the persons for whom they were made must be gathered in groups or placed singly in envelopes or boxes which must be addressed and made ready for mailing or other delivery. This part of the work requires an average of four hours for 100 orders.

Summarizing the above on the basis of wages of $1 per hour to those who perform the several operations, the cost is as follows:

1	$1.75
2	3.00
3	4.00
4	1.50
5	3.00
6	4.00
	$17.25 or 17¼ cents per microfilm.

This is believed to be a liberal estimate which is subject to reduction by improvements in organization of the work. It will serve as a basis for comparison with the hest estimates that can be made of the cost to libraries of furnishing books to readers or borrowers.

It will be noted that full-time salaries have not been included in the above estimate. Such would not be justified until the volume of work increased sufficiently. Fortunately, the making of microfilms does not require special qualifications and for the most part can be learned quickly by persons capable of doing other library work. The time they would ordinarily devote to serving readers can be employed in the several operations involved in making microfilms. There would thus he very little additional cost to the library for making microfilm copies instead of serving readers or charging and discharging books for borrowers. It would involve only a slight modification of the duties performed by certain members of the library staff. If, as might he expected, the operation of a free microfilm service results in a very great increase in the amount of work a library is called upon to perform, this would simply be an evidence of the increasing use being made of the resources of that library and an indication that the library is fulfilling to a greater degree the purposes for which it exists. The additional funds to support such a meritorious extension of library activity should not be difficult to obtain.

The only question which arises concerns the extent to which a library is justified in extending its facilities to readers at a distance for whom no obligation to serve has hitherto been recognized. This is a matter which should be considered from the point of view of the general welfare. The advancement of science, for example, is a collective endeavor and the contributions of those outside a given institution, of which the library is a part, may be equally as important as those made within that institution. The efforts to solve the problems with which a given institution may be charged would be reduced to the extent to which contributions to those problems may be made by persons on the outside who are aided by the library resources of that institution. It is even conceivable that a given institution might be able to contribute more by placing the resources of its library at the disposal of the larger number of workers at a distance than by reserving them for the relatively few in the immediate vicinity.

Microfilm copying thus offers librarians the chance to contribute more largely than ever before to the advancement of knowledge. Those who desire to extend the aid they may be able to render science and learning more widely than the limits fixed by their immediate duties will recognize the exceptional possibilities offered by microfilm copying.

Microphotography at the Boston Conference

H. H. LITCHFIELD

At the Boston Conference of the American Library Association, the Committee on Photographic Reproduction of Library Materials held a joint meeting with the University Libraries Section of the Association of College and Reference Libraries on Monday afternoon, June 23. Under the Chairmanship of Mr. Keyes D. Metcalf, Director of the Harvard University Libraries, three formal papers were presented.

The first by Dr. Adele Kibre, research assistant in the Department of the Humanities, University of Chicago, was entitled "Microphotography in European Libraries" and consisted of a vivid personal account of her experiences in copying manuscripts belonging to libraries and archives in every corner of Continental Europe. The work was commissioned by members of the faculty of the Department of the Humanities of the University of Chicago, by University Microfilms and others, and extended over a period of eleven years.[1]

The second paper entitled "Current Microphotographic Problems" by Mr. Herman H. Fussler of the University of Chicago Libraries, was illustrated by lantern slides of reading machines and charts showing the comparative charges for microfilm by various laboratories in the United States. Following this paper the Chairman invited questions from the floor on any phase of microfilm. An abridged record of the discussion is as follows:

Q. *Are there catalogs of microfilm prices available?*

A. Most of the figures cited in my paper and on the lantern slide charts are taken from material already printed in the JOURNAL OF DOCUMENTARY REPRODUCTION.

[1] A condensation of Dr. Kibre's paper appears in this number of the *Journal*, p.158-63.

Q. *Will microfilms be made available for interlibrary loan?*

A. Several factors have to be taken into consideration. First, they are fragile and liable to deterioration by scratching if not properly handled; second, all libraries do not have good reading machines; third, positive prints are very cheap.

The third paper presented by Dr. Vernon D. Tate of The National Archives was entitled "Microphotography and the Public Records" and concerned large scale projects and recent technical progress involving microphotography in the federal government. Following this paper there were numerous questions and a general discussion which may be summarized as follows:

Q. *Are there lists of the material which is available at the Library of Congress on microfilm?*

A. (*Mr. Schwegmann*). At the Photoduplication Service of the Library of Congress we have compiled a list of microfilms of newspapers including those we have. It has just been accepted for publication by the JOURNAL OF DOCUMENTARY REPRODUCTION.[2] We have been maintaining a union catalog of microfilms in the Library of Congress and in other libraries. The information sent to us is frequently insufficient. Libraries, in addition to the author and imprint information, simply state "Microfilm copy." In addition, the cards ought to state:

1. Number of feet or reels
2. If available for interlibrary loan
3. Whether negative or positive
4. Kind of camera used to make film
5. Whether positives are available for sale

Q. *Will Mr. Power tell us something about the microfilming project now going on in England?*

A. (*Mr. Power*). A grant was made to the American Council of Learned Societies by the Rockefeller Foundation for filming rare manuscripts in Europe. We are working only in England at the present time, but hope to work in other countries if the opportunity offers. Five cameras are now in operation and one more on the way. Filming of 14,000 volumes has been ordered involving 6 to 8 million exposures.

[2] See *Journal*, IV, 122-34.

Q. *Who decided which manuscripts to film?*

A. (*Dr. Kellar,* Library of Congress, Chairman of the American Council of Learned Societies committee on selection of material for microfilming). They are mostly historical manuscripts from university and private libraries.

Q. *University Microfilms has been keeping negatives of manuscripts and excerpts ordered for libraries and individuals. Are we at liberty to reproduce them?*

A. That is a difficult question. It will take years to settle it.

Q. *Can we have something now on the care of film?*

A. The care of film involves: (1) condition of the original film; (2) method of storage; (3) manner of handling. The National Bureau of Standards has published a list of qualifications for good microfilm.

Q. *What is the history of the* Sessional papers *project?*

A. Some years ago a Committee on Historical Source Materials of the American Historical Association became interested. After lengthy investigation it was decided to have microprint copies made of the *Sessional papers* from 1801 to 1900. The project will be carried out only if enough orders are secured to underwrite the expense.

Q. *Why was it decided to use microprint instead of microfilm?*

A. Because microprint is cheaper for a job where many copies are wanted. If only a few copies are wanted, microfilm would be cheaper. The edition of the *Sessional papers* is being published hy Mr. Albert Boni; literature is being distributed by Dr. Edgar L. Erickson of the University of Illinois.

Q. *What about the facsimile reproduction of catalog cards now going on at the Library of Congress?*

A. (*Mr. Schwegmann*). The Radio Corporation of America developed a machine for reproducing radiograms that came in over the teletype. We asked them to adapt their machine for reproducing catalog cards. During this next August or September there will be one of three of these machines at the Library of Congress for experimentation. One limitation is that the paper on which the reproductions are made is too thin for easy filing in the catalog.

The audience was large and many of the questions elicited by the chairman bore little relation to the technical papers that had been pre-

sented. There seems to be an inescapable conclusion here: librarians want to know more about the elementary facts of microfilm. All larger college and university libraries have some person on the staff whose business is the care of films; but there are still a good many smaller institutions which would like to use microfilms but do not know how to begin or how to care for the ones they already have.

There is a Committee on Reproduction of Library Materials; there is a journal for technical discussion; there are courses in the summer sessions of two graduate library schools; there is a semimonthly column in the *Library Journal*. These are not enough, and most of these aids are too technical and advanced for the average librarian who does not handle film often enough to get much experience with it. Perhaps it is time to divide microfilm users at the annual meeting into two groups: those who wish to read and discuss technical papers on microphotography and large scale projects; and those who need to know more about methods and storing the film itself in the average public or college library.

Exposure Notes

DONALD C. HOLMES

With the increasing use of microphotography by scholars, scientists, and librarians to reproduce manuscript and printed materials, standards of quality have been materially raised. It is no longer sufficient to produce microfilm of greatly varying density, for frequently it cannot be used in modern reading machines or printed on continuous printers. Professional technicians and individuals personally undertaking to make their own microfilm have therefore become much more concerned than formerly in producing microfilm of good photographic quality.

Much experimentation with cameras, lenses, light sources, filters, sensitive materials, and processing has resulted in the production of equipment, supplies, and processes capable of producing uniformly good results. The professional technician has little difficulty in most cases. After all, it is his business and no one remains in business long unless his product is up to standard. The beginning technician and the individual scholar or scientist for whom microphotography is merely an incidental operation or a means to an end, frequently find considerable difficulty in obtaining results comparable to those of professionals. Probably the single greatest obstacle has been the determination of exposure.

The most valuable tool in determining correct exposure is a photoelectric cell meter which registers the amount of light reflected from an original in units or foot candles through the conversion of light into minute quantities of electricity which can be measured by a meter of sufficient sensitivity. There are, however, certain errors inherent in all present-day meters which frequently cause difficulty. In general photography the latitude of the sensitive material employed will usually compensate for these errors. Unfortunately the sensitive materials provided for documentary reproduction possess little or no latitude; exposure and filter calculations must be absolutely accurate if satisfactory results

are to be obtained. It is possible to demonstrate the most serious error inherent in photoelectric meters used in documentary reproduction by procuring two pieces of white paper preferably cut from the same sheet, one 4 x 5 inches, and the other 8 x 10 inches in size (note that the larger paper is exactly twice the linear dimensions of the smaller and contains four times the area). With the meter in the same position readings are made from each sheet. It will be noted that the reading from the larger paper will be greater, although both were of the same color and were cut from the same large sheet. As all originals to be microfilmed are not identical in size some method of compensation for this error must be employed or the background density of the film will not be uniform. The simplest method of compensation is to secure a sheet of matte black paper 18 x 24 inches in size (this size has been selected as proportional to the sensitive area of most photocells); and cut a rectangular hole or window 3 x 5 inches in size in its center. The window opening will usually cover even the smallest document to be photographed and an average portion of a larger original. The black paper is placed over the original and the reading taken for the limited area. This basic reading is calibrated to the balance of the exposure cycle (for lens aperture and time) and to the processing solutions employed. In most cases its use will prodnce negatives of equal density from a variety of originals.

It is absolutely essential to standardize the placement of the photocell when making readings on originals. The exact position is not important if the meter has been calibrated to the rest of the operations; unless readings are made from the same point, they are virtually useless. Two types of photoelectric meters are in common use; the first type, marketed for the amateur or general photographer, comprises the photocell, the sensitive meter and a simplified slide rule calculator; the second, used by lighting engineers and called an "illumination meter," consists only of the photocell and the meter. The latter is somewhat cheaper than the former, and as the calculator is not used in documentary reproduction, will serve equally well. An arm on the central columns or a small meter stand to support the meter in the same relative position is essential.

A small stand for the meter may be constructed of wood or metal, preferably the latter, with little difficulty. It resembles a miniature table

with four legs and a table top. The table top should measure approximately 4 x 6 inches, and the legs should be 6 inches in length. If of metal, an apron should be made around the table top extending about 1 inch toward the base. A rectangular hole slightly smaller than the photocell is cut in the center of the table and the meter is mounted directly over the hole. An adjustable cover is fitted underneath the table top so the rectangular hole exposing the meter unit can be used in its entirety or covered by fractions. (A screw thread adjusting a thin metal shutter is a convenient method.) The complete unit is then placed directly over the 3- x 5-inch window in the matte black paper. Trial exposures are made to determine the correct meter reading. Once the correct exposure is found, the same meter reading, lens stop and shutter speed may be used consistently. With this system, regardless of the size and color of the material to be copied, correct exposure will always be obtained.

Factors and correct exposure, when color filters are used, can be determined easily. To calibrate the meter, after determining the correct meter reading as described above, the lens stop and shutter speed are left in the same positions; the filter is placed over the lens and the light intensity is increased in steps with a rheostat or transformer as meter readings are recorded and test exposures are made. When the correct exposure is determined, the light intensity is altered to correspond to the proper meter reading, and with the exposure meter in place the adjustable shutter under the table is closed until the meter reading is equivalent to that when the filter was not used; that is, if the correct reading without filter was 25 and the correct reading made in the test with filter was 50, then the shutter should be closed until 25 is registered on the meter. The position of the partially closed shutter should be marked for future use with the same filter. Generally, the "Wratten G" filter will be found adequate for average documentary photography, but should other filters be needed the same procedure is followed, and the shutter is marked for each filter.

A Simplified Book Cradle

FRANK W. BOBB

When microfilming bound materials of varying sizes and shapes in quantity, some type of book cradle is essential for rapid and efficient operation. The manually operated reciprocating cradle described in this article and illustrated in the attached sketch plan was made up at a cost of less than $6 for use with the Photorecord camera, but will serve equally well for any other similar camera.

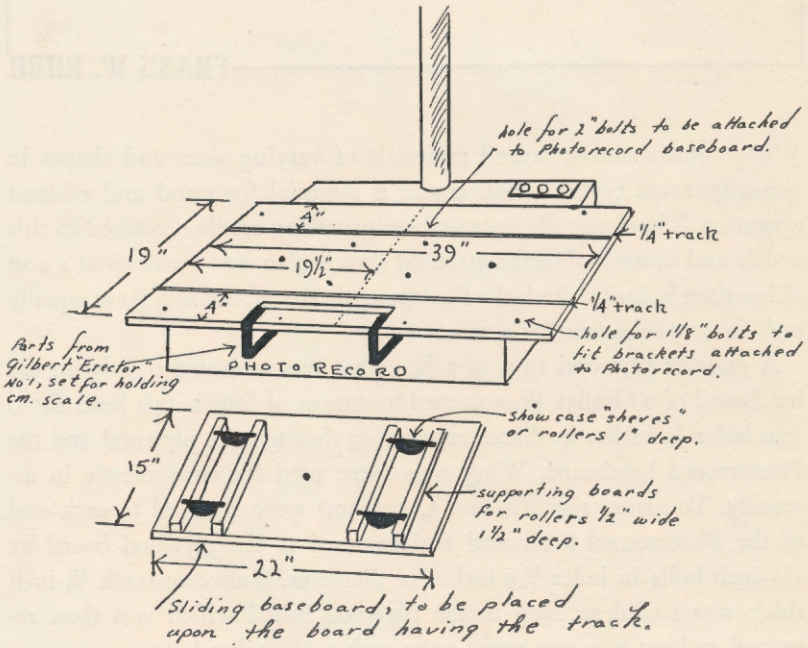
A piece of plywood 19 x 39 x ⅜ inches was mounted tightly on the baseboard of a Graflex Photorecord by means of four 2-inch bolts fitted into holes ⅜ inches in diameter running through the plywood and the Photorecord baseboard. Wing nuts were used for convenience in assembly. To assure rigidity, two L brackets were attached to each end of the Photorecord baseboard and fastened to the plywood board by 1⅛-inch bolts in holes 3/16 inches in diameter. Showcase track ¼-inch thick was nailed securely to the plywood board which was then removed and cut into two equal parts each 19½ inches long.

A Gilbert "Erector" set supplied parts to support a centimeter scale which was attached to the center of the plywood board. The scale is used to line up the material being copied, and at the same time serves as a size indicator on completed microfilms.

To another piece of plywood 22 x 15 x ⅜ inches in size, four strips of wood ½-inch square and 14 inches long were attached in pairs, each pair being far enough apart to allow two showcase rollers one inch deep to fit snugly between them. The rollers were then lined up so that the board slid smoothly along the tracks. This sliding baseboard serves to support the volumes to be filmed, permitting them to be rolled under the lens so that left- and right-hand pages can be easily photographed in sequence.

A ⅜-inch hole was drilled through the center sections of both the

large and small boards so that when the assembly is dismantled into sections, it may be held together by a single holt and carried as a compact unit.


hole for 2" bolts to be attached to Photorecord baseboard.
4"
19"
19½"
39"
¼" track
¼" track
4"
hole for 1⅛" bolts to fit brackets attached to Photorecord.
Parts from Gilbert "Erector" No 1, set for holding cm. scale.
PHOTO RECORD
show case "sheves" or rollers 1" deep.
15"
supporting boards for rollers ½" wide 1½" deep.
22"
Sliding baseboard, to be placed upon the board having the track.

The materials bill for the construction of this device is as follows:

Plywood board	$1.90
Showcase track	.90
Showcase rollers	.80
Gilbert "Erector" set	1.00
Centimeter scale	.10
Bolts, nuts and washers	.39
L brackets	.10
Boards for supporting rollers	.09
	$5.28

Reflection Copying

SPENCER C. DUTY

REFLECTION copying is a photographic method of reproducing written or printed material without using a camera. When one needs to duplicate a large number of pages inexpensively, microphotography solves the problem; however, when only a few pages are required from different books from time to time, it may be more convenient for both the user and the librarian if the work can be done in some simple manner hy the researcher himself. Reflection copying permits duplicating of printed or written material, maps or charts, at a material cost of about two cents per 6 x 9 inch page and an initial equipment cost of less than ten dollars. It is more accurate and quicker than typewriting, less expensive than commercial photostating, and the equipment is easily portable. There are a number of reflection copying outfits on the market, but they cost too much for the average individual researcher and are too bulky to carry with ease. For this reason, the following description of an inexpensive, easy-to-make piece of copying equipment and its use may be of interest.

The necessary equipment is smaller than a portable typewriter and may be used in any room having no more than the usual amount of illumination. It consists of a copying box having the base and two ends made of wood. The two sides are of sheet metal, and the top is of plate glass one fourth of an inch thick, under which is a piece of opal glass. Thin strips of rubber are placed between the opal glass and its support, as shown in the drawing. The opal glass, which is available at any photographic supply store, should have its white side toward the inside of the box and should be held in place by being clamped between its rubber support and the plate glass. The plate glass extends over the ends of the box and is held in place by the metal covering of the box. This metal covering is chiefly for appearance and may be eliminated except for the

part which holds the glass in place. The sides should be of sheet metal, which is the only material thin enough to allow the copying box to work close to the inside bound margin, and one side must be easily removable to provide access to the inside of the box, which is painted white.

Inside the box are three "Lumiline" lights, available at most electrical or hardware stores. These lights are cylindrical in shape, one inch in diameter and twelve inches long, including their brackets. One of them should be in the center of the box and the others on either side. They should be three inches apart measuring from the center of one to the center of the next, and there should be at least an inch and a half between the opal glass and the nearest part of the "Lumiline" lights. If these dimensions are changed, an uneven distribution of light may result. The space between the lights may be used for storing the electrical cord, while the space between the opal glass and the lights may be utilized for a light-tight box containing photographic paper, and for a piece of glass one-eighth inch thick, eight inches wide, and eleven inches long. This glass is used as a back-up to provide an unyielding flat support for the page to be copied.

Before copying, the light-tight box and the back-up glass must be taken out and the removable side of the copying box replaced. The page to be copied, if unbound, is put face up on top of the back-up glass which has been placed on a table; if a page of a book is to be copied, the book is opened wide and laid on a table. The back-up glass is placed directly under the leaf which contains the page being copied. A piece of photographic paper is placed on this page, with the emulsion side in contact with it, and the copying box is placed on the photographic paper with its glass side in contact with the paper. The page to be copied and the photographic paper are thus sandwiched between the back-up glass and the plate glass of the copying box. Exposure is then made by turning on the lights of the copying box. Proper exposure time is about six seconds, with a leeway of approximately one second either way. However, although exposure time is only six seconds, it is difficult to copy a book much faster than one page per minute if the attendant preparations are taken into account.

The light from the copying box goes through the photographic paper and strikes the page being copied. Where that page is white, the light

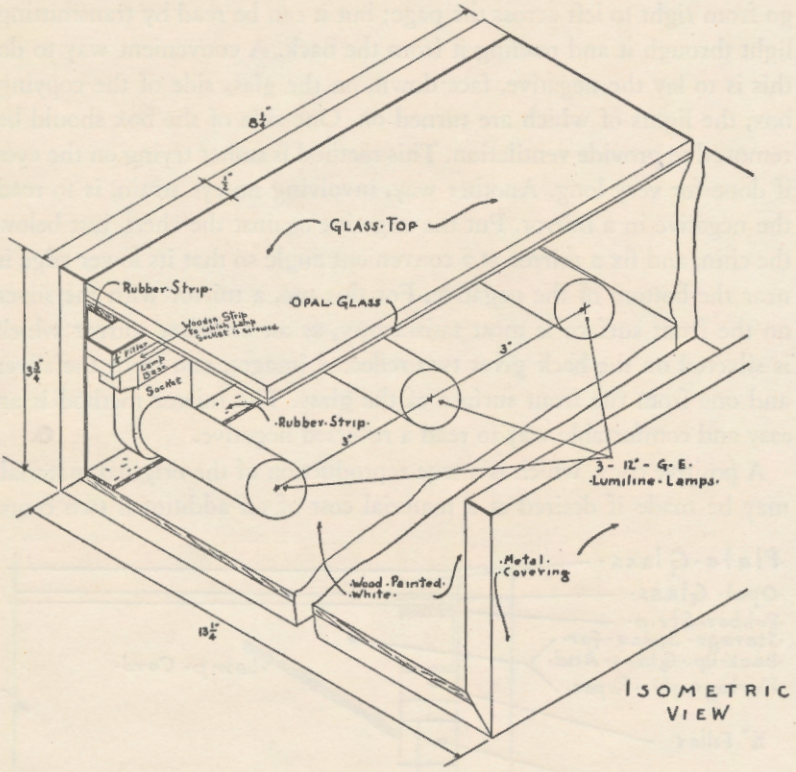


FIG. 1.

is reflected back to that part of the photographic paper in contact with the white section, and exposure takes place. The light which strikes the black lines of the printing is absorbed and the paper in contact with the black lines is not exposed. Red or black lines in the original material reproduce in the negative as white; blue or white in the original reproduce black; and colors between red and blue in the spectrum reproduce as different shades of gray. After exposure, the paper is developed, fixed, washed, and dried in the usual way. Developing need not be done immediately. A month between exposing and developing will give no ill effects.

The copy made in this manner is a negative the same size as the original material. It cannot be read directly, however, because the words

go from right to left across the page; but it can be read by transmitting light through it and reading it from the back. A convenient way to do this is to lay the negative, face down, on the glass side of the copying box, the lights of which are turned on. One side of the box should be removed to provide ventilation. This method is rather trying on the eyes if done for very long. Another way, involving no eye strain, is to read the negative in a mirror. Put the negative against the chest, just below the chin, and fix a mirror at a convenient angle so that its lower edge is near the bottom of the negative. For this use, a mirror with the silver on the front surface is most satisfactory, as an ordinary mirror which is silvered on the back gives two reflected images, one from the silver and one from the front surface of the glass. The mirror method is an easy and comfortable way to read a reversed negative.

A positive copy, which is a true reproduction of the original material, may be made if desired at a material cost of an additional two cents.

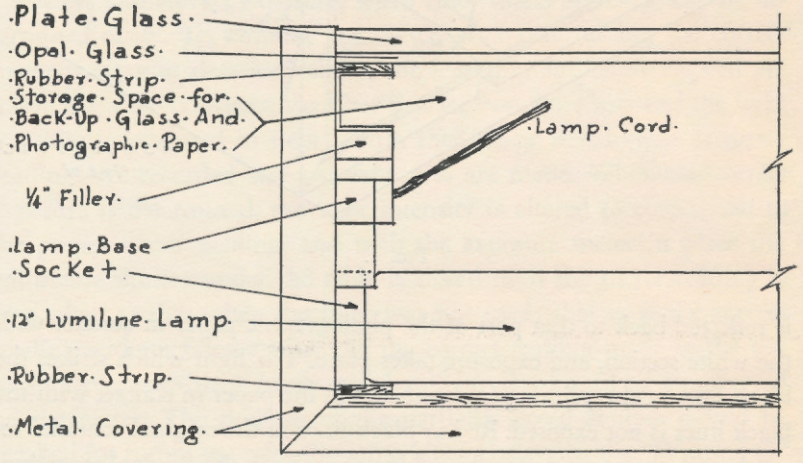


FIG. 2.

Sandwich the negative and an unexposed piece of photographic paper, the two emulsion sides in contact, between the plate glass of the copying box and the back-up glass. Have the negative next to the

plate glass and the unexposed paper next to the back-up glass. Expose for 45 to 60 seconds, being careful to maintain perfect contact between the two pieces of paper during exposure.

The most important thing in successful reflection copying is to have perfect contact between the entire surface of the photographic paper and the page being copied in order to prevent fuzzy reproduction which may be illegible. To insure this perfect contact, it is necessary to lean rather heavily on the copying box while the exposure is being made taking care, of course, not to damage the original being copied. Many different materials were tried as a substitute for glass as a back-up in order to obtain good contact. Various kinds and thicknesses of sheet metal, cloth, rubber, carpeting, and leather were tried, all unsuccessfully. Glass about one-eighth inch thick seemed to be best. Thinner glass might break, while a thicker piece used with a closely-bound book having a narrow inside margin might make it impossible to copy the entire page.

The kind of photographic paper used is very important. Many different kinds were tried but only two gave good results. The best, and also the cheapest, is Eastman's "Velox" No.5, although No.4 is very good. The other satisfactory paper is "Copylite," made by the Haloid Company, which gave very good results but is slightly more expensive and not so widely sold. Usable negatives cannot be made with blueprinting or diazo-type papers, even though a mercury light is used for exposure. The most economical size paper is 5½ x 7¾ inches, bought by the gross. Both recommended papers are satisfactory also for making positive copies. Eastman's "Ad Type" is very good for positive copies since it is uncoated and does not reflect as much glare into the eyes of the reader as "Velox." It is, however, entirely unsatisfactory for making the negative.

Reflection copying is best done in a room that is not too brightly illuminated, although either of the recommended papers can be used on the ordinary well-lighted desk if average care is taken. Keep the emulsion side of the paper away from the light and, if possible, have the desk top covered with a dark, rough material that is not a good reflector. A blotter is recommended. Have the book opened to the proper page and put the back-up glass in place before taking the paper from its

container. As soon as the paper is in position on the page, cover it with the copying box. Do not have any paper out of the light-tight box longer than necessary.

Reflection copying has certain advantages compared to other methods. The equipment is simple, easily constructed, and readily portable. It will fit into a large brief case. The cost of operation, while higher than microphotography, is low compared to commercial photostat copying. The chief advantage is in the very small investment required for equipment, as the materials necessary to construct the copying box cost less than ten dollars. Among the disadvantages are the necessity for using some device to read the negative and the labor of developing when a large number of pages have been copied.

The Portable Microfile Recordak, Model E

THE PORTABLE Microfile Recordak, Model E is an extremely versatile precision microfilming unit for the reproduction of bound or unbound documents placed on a copy holder beneath the camera, for photographing larger materials placed against a wall or on a vertical copy board, or for personnel identification work. All required equipment is packed in two sturdy traveling cases, one weighing approximately 35 and the other approximately 40 pounds. They can be completely unpacked and the camera assembled ready to operate in ten minutes.

The portable units are designed for use when documents do not exist in sufficient quantity to warrant a large permanent installation, yet cannot be moved to a central point for microfilming and must be filmed in field offices or several separated locations. For example, a field auditor can copy the various records in which he is interested and forward microfilms to a central or home office to be worked over by a complete office force at any suitable time, thereby effecting considerable economies in field-auditing costs. Furthermore, a permanent facsimile record of the documents audited, requiring little storage space, is a valuable by-product of the operation. Title or abstract firms desiring to make copies of records in county court houses can reproduce facsimiles conveniently and rapidly. The small size of the equipment together with the speed of the process obviates the need for removing active records from working departments for any considerable period of time, and consequently reduces confusion and file displacement to a minimum.

The present emergency has caused many governmental units and commercial firms engaged in defense activities to install photographic identification card systems. The portable Microfile Recordak may be used to advantage to make the required personnel photographs.

The unit consists of the Microfile camera Model C (described in the

JOURNAL, Vol. III, p.51), a special calibrated tripod stand, an adjustable copy board, lighting equipment, and a complete set of exposure controls including a photoelectric cell meter, rheostat, voltmeter, etc. Books or

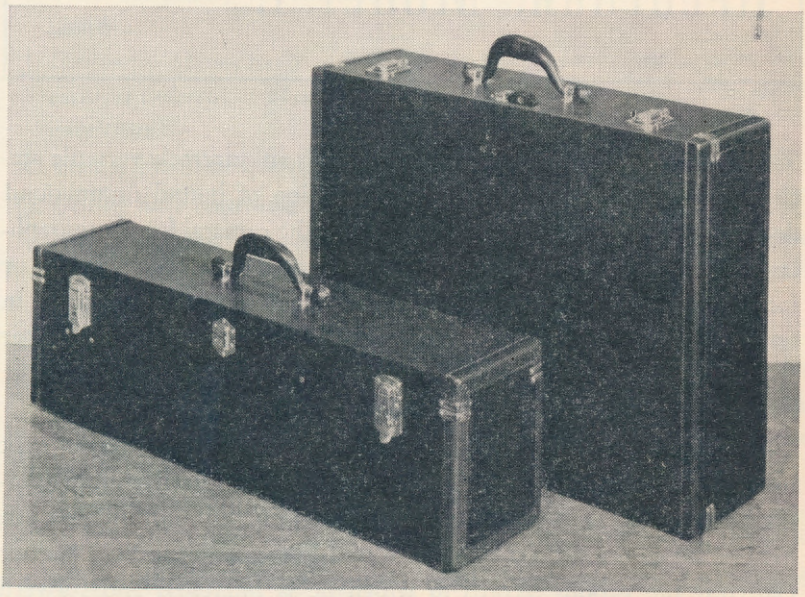


FIG. 1. Portable Microfilm Recordak, Model E, Packed

unbound documents up to 19½ x 24½ inches in size may be microfilmed on the copy board at 18 diameters reduction. The copy board can be raised or lowered to accommodate books of varying thicknesses, thereby keeping the material being copied in accurate focus at all times. For copying larger originals placed on a vertical copy holder or pinned to a wall, the tripod is placed on the floor and the camera head mounted on the top of the stand. In this position a maximum field of 37½ x 52½ inches may be photographed at 30 diameters reduction. The camera lens is calibrated for reductions of 8 through 30 diameters, and a marked steel tape is built into the camera to measure the proper object distances at the various reduction ratios.

In common with other Microfile equipment the Model E featnres variable frame size and its attendent film economy. When a button is

pressed, the film aperture is projected on the copy board; the width of the image is adjusted by raising or lowering the extension legs of the tripod, thus regulating the amount of reduction by the size of the original. Another control varies the length of film to correspond to the length of the original. When the area of the aperture has been fixed in this manner, the camera advances the exact amount of film necessary for each exposure. In this way the full width of the sensitive material is used, and film waste between exposures is eliminated.

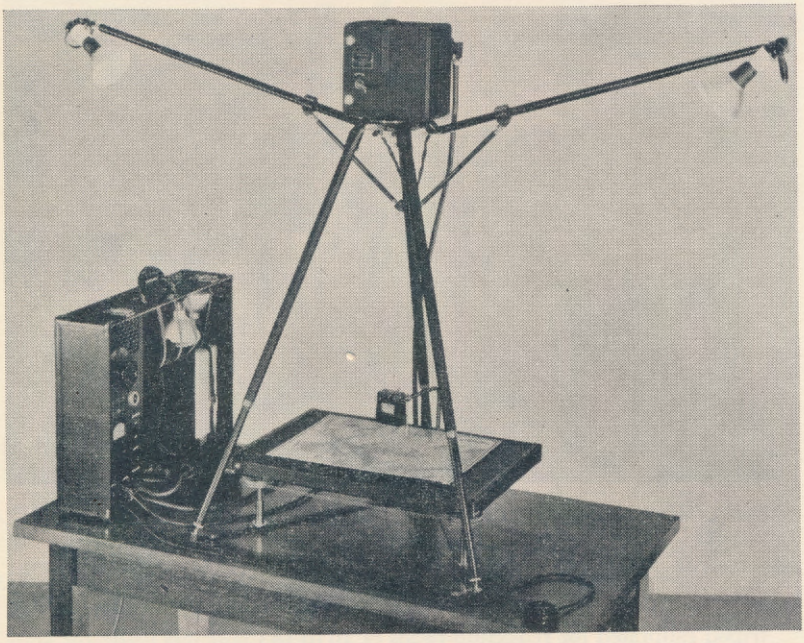


FIG. 2. Portable Microfilm Recordak, Model E, Using Copy Holder

Detailed specifications include the following:

Camera: Standard model C (described in JOURNAL, Vol. III, p.51) with field indicator and proportional film advance; film capacity, 100 feet; film sizes used, 35mm. nonperforate and 16mm. single perforate (using conversion parts supplied); conversion parts available to adapt camera to use 35mm. double-perforate film.

Lens: Special f:4.5, 63mm. Kodak Ektar with diaphragm permanently set at

f:8; lens mount graduated from 8 to 30 diameters reduction. A locking device on the lens barrel assures proper reduction ratio after setting is made.

FIG. 3. Portable Microfilm Recordak, Model E, High Reduction Filming with Copy Placed on Wall

Stand: Specially designed tripod incorporating an adjustable copy board; tripod calibrated for reduction ratios of 10 to 18 diameters using the copy board. Tripod serves as rigid stand when using vertical copy holder or wall for ratios of reduction of from 8 to 30 diameters.

Lights: Two 500-watt R-2 Photofloods operating at 75 volts to prolong their life, mounted on special adjustable arms attached to the stand.

Electrical Equipment: Unit designed to operate on 110-volts 60-cycle alternating current, but may be readily adapted through the use of a converter (sold as an accessory) for use with direct current. A switching circuit automatically makes proper connections when the unit is plugged into A.C. or D.C. supply, thereby preventing damage to unit by plugging

into wrong type of current. Control rheostat, voltmeter switches and panel permanently housed in the larger of the two carrying cases.

Electrical Counter: Provision has been made on the control panel for an electrically operated counter (sold as an accessory). This counter is placed in the photographic field and is used to number each exposure serially.

Portability: Unit may be rapidly disassembled and all parts fit in two carrying cases, total weight approximately 75 pounds. Space is included in cases for two spare lamps, extension cords and a supply of film.

The Portable Microfile Recordak, Model E is the latest of a series of microfilming machines designed and marketed by the Recordak Corporation. These include the rotary Commercial Recordak, the Reversible Recordak, and the Recordak Junior, all designed for loose sheets and employing 16mm. film, the larger planetary or flat bed machines for 16 and 35mm. film, including the Model C-1 with reciprocating book cradle for large bound volumes, and the Model D, a general purpose nonportable machine for medium size flat documents and bound volumes.

The Portable Microfile Recordak, Model E is available for sale, and under certain conditions for rent. Inquiries should be addressed to the Recordak Corporation, 350 Madison Ave., New York, N.Y.

NEWS and TECHNICAL NOTES

Bell and Howell Still Projector

The first "still" projector manufactured by Bell and Howell, the Filmo Slide Master for 2 x 2 inch black and white or color slides in paper or glass mounts, has recently been placed on the market. Several interesting new features have been incorporated in the design. A new type projection bulb burning "base up" is used for the first time. Its chief merit is found in the fact that the blackening deposit formed during the operation of the lamp falls to the bottom of the bulb instead of adhering to the sides where it would reduce light transmission. Either 500-, 750- or 1000-watt lamps may be used. A motor driven fan provides ample circulation of air even with 1000-watt bulbs. A choice of 3½, 5 or 7½ inch f/4.5 projection lenses is offered. Complete information may be secured from Bell and Howell, 1801 Larchmont Ave., Chicago, Ill.

Bibliotheque Impartiale on Film

A master microfilm negative of the complete file of the *Bibliothèque Impartiale,* Vols. 1-18 (1750-1758) has been prepared by the University of Chicago Libraries. The file contains 8364 pages, and positive reproductions which may be read on any kind of reading machine are available to other libraries at $40.

Catalog of Materials Available on Microfilm

Southwestern Microfilms, Inc., Santa Fe Building, Dallas, Texas, has issued General Catalog D, 16 pages containing 355 titles of rare and early printed material available on microfilm. The items for the most part concern slavery and the Civil War, although many general entries are included. In common with other catalogs previously noted in the JOURNAL, the microfilms are supplied on 35mm. double perforate film at placement 2. Copies of the present catalog may be secured from Mr. Homer L. De Golyer at the above address.

Check List of Newspapers on Microfilm

In the last number of the JOURNAL Mr. George A. Schwegmann, Direc-

tor of the Union Catalog and the Photoduplication Service of the Library of Congress published a list of newspapers that had been placed on microfilm (JOURNAL, Vol. IV, p.122-24). In order to fill numerous requests for reprints the article has been duplicated and copies are obtainable from the Union Catalog. It should be noted that the list is preliminary and institutions owning microfilm files not included in it are urged to forward complete information to Mr. Schwegmann for incorporation in a forthcoming supplement. While the list was being prepared for publication the name of Mr. Karl Adams of Graphic Microfilm Service was inadvertently omitted from the acknowledgments to those submitting material for the check list. A further correction should be made. On p.128 appears the entry for the *Maryland Gazette*. In a letter to the Editor of the JOURNAL, Mr. Bernhard Knolenherg, Librarian of Yale University Library writes as follows: "When the project of filming the *Maryland Gazette* was first considered, we canvassed the large libraries of the country and received subscriptions from a good many. We made only enough copies for these suhscribers, and we have no others available."

COLOR PRINTS FROM KODACHROME

Kodachrome film transparencies supplied since 1936 in sizes to fit miniature cameras and since 1938 in larger professional sizes have been extensively used to photograph originals in full color. Although color prints on paper have been possible, and to a certain extent have been procurable, the processes have been beyond the limits of all but the best-equipped professionals and amateurs. The Eastman Kodak Company has now made available tbrough its retail marketing agency, the Eastman Kodak Stores, a service whereby large full-color prints may be procured from suitable transparencies. Kotavachrome professional prints are made with dyes on a special white pigmented cellulose acetate support. Kodachrome transparencies may be enlarged to a maximum of 6 diameters. The dyes used are claimed to he stable, but it is stated that if the prints are exposed to direct sunlight for a period of time, the dyes may change in color. Prices range from $12 for the minimum size, 8 x 10 inches, to $90 for the maximum size 30 x 40 inch prints. In all cases additional prints from the same negative made at the same time are lower in price.

COMMERCIAL MICROCOPYING SERVICE IN NEW YORK

The Microcopying Service Company, a Division of New Process

Studios, 49 East 21st St., New York, is offering a microfilm service for loose sheets of all types. The price for each exposure or full microfilm negative is 3 cents, minimum order $1; positives are made for 6 cents per foot; photoprints size 6½ x 8½ inches are 15 cents each and size 8½ x 11 inches are 20 cents each. Work will be undertaken either at the home laboratory or in the offices of clients. Mail orders will be filled but carriage both ways is at the expense of the sender.

Committee Changes

The American Library Association Committee on Photographic Reproduction of Library Materials which among otber activities sponsors the JOURNAL, for tbe forthcoming year will consist of the following members:

Ralph H. Carruthers (Chairman)
Assistant in Charge, Photographic Service
New York Public Library
New York, N.Y.

Leland Baldwin, Librarian
University of Pittsburgh Library
Pittsburgh, Penna.

Herman H. Fussler, Head
Libraries Department of Photographic Reproduction
University of Chicago
Chicago, Ill.

Clara J. Kelly, Senior Librarian
Reference Division
University of Washington Library
Seattle, Washington

Samuel W. McAllister, Associate Librarian
General Library
University of Michigan
Ann Arbor, Michigan

George A. Schwegmann, Jr.
The Union Catalog and Photoduplication Service
Library of Congress
Washington, D.C.

Du Pont Films for Documentary Reproduction

A pamphlet of 18 pages entitled "Du Pont Films for Documentary Reproduction" has been prepared by the Du Pont Film Manufacturing Corporation, 9 Rockefeller Plaza, New York. It contains general information on three Du Pont films recommended for documentary reproduction. These include: Safety Microcopy, Safety Positive and Fine Grain Safety Positive. Notes on exposure determination, speed, including Weston ratings, color sensitivity, filter factors, resolving power illustrated with charts, graphs and spectograms, together with developing information, formulas, storage and packaging make the pamphlet exceedingly useful. Copies are available for *gratis* distribution from the above address.

Early Records of Boston on Microfilm

In a 9-page city document entitled "Report of City Clerk on Duplication of Boston Records" (Document 50-1941) Mr. Wilfred J. Doyle, City Clerk, describes the process of microphotographing 225 volumes of the earliest and most valuable records of the city of Boston. These range in date from 1629 to 1911, and include Boston Town records, Boston Selectmen's records, Boston City records, Dorchester Town records, Charlestown Town records, Roxbury Town records, Brigbton Town records, West Roxbury Town records and Hyde Park Town records. All are listed in an appendix to the report. A negative and a positive were made; both are deposited in the Boston Public Library where positives will be made available to the general public. The work was performed by the Graphic Microfilm Service, Waltham, Massachusetts. It is interesting to note that the originals stored in the City Clerk's vault in the City Hall Annex (two stories below the street level) occupy 70 linear feet of shelving space 20 inches high and 13 inches deep; in all, 126 cubic feet. *Two* microfilm reproductions of these records (a negative and a positive) in a special cabinet occupy less room than an ordinary file case of 12 cubic feet. Copies of the report may be secured from the City Clerk's office.

Espionage by Microfilm

In a world at war, it is inevitable that microphotography with its great potentialities should be seized upon and made to serve many ends. In the recent espionage trials in New York, it was revealed that microfilms listing American commercial and naval vessels have been made and transmitted to Germany. Through the activity of counter-espionage agents, these films were seized, and after being reproduced in such a manner that their content was rendered virtually valueless, were allowed to be sent along. Numerous complaints of the poor quality of the films were subsequently received by foreign agents in this country.

Forthcoming List of Materials on Microfilm

The Philadelphia Bibliographical Center and Union Library Catalogue has undertaken as a part of the cooperative library program now under way in Philadelphia to compile a list of materials available on microfilm. A Committee on microphotography has been appointed and has requested copies of shelf lists of titles on microfilm from various libraries. The objective of the program is to encourage cooperative purchasing to secure more materials for use within a given area, and to compile a list of titles repre-

senting microfilm holdings. The Committee is interested in complete volumes, sets or series, not in individual pages or small filming jobs. "Master" negative files from which positives may be procured are of particular interest. Libraries that have not already done so are urged to cooperate in this project. It was originally planned to publish the list serially in the JOURNAL but the number of entries, now in excess of 3500, far exceeds the limits of available space, consequently separate publication is indicated. The real magnitude of the list may be realized when it is considered that a single entry may cover a rare volume of perhaps 100 pages or the entire program of filming all English books printed before 1640.

FRENCH OFFICIAL JOURNAL MICROFILMED

The Journal *Officiel de l'Etat Français* (Vichy) from June 1, 1940 to August 12, 1941 has been microfilmed by the Library of Congress Photoduplication Service from one of the few complete files received in the United States. The 8000 pages for this period have been microfilmed two pages to the exposure at approximately 14 diameters reduction. Positive prints of this microfilm on projection reels and in cardboard containers are available for $30.

FUND FOR PURCHASING RHODE ISLAND NEWSPAPER MICROFILMS

Miss Grace M. Sherwood, Librarian of the State Library of Rhode Island has announced the completion of arrangements to transfer a fund of $1000 from the Governor's Contingency fund to the State Library "to purchase back files of microfilm of the *Providence Journal* and the *Providence Evening Bulletin* for 1938 through 1940; and to purchase microfilm of tbe same newspapers for 1941 and 1942; and to purchase one film reader."

THE KODAK MEDALIST

A camera of exceptional possibilities has been added to the Kodak line of precision cameras for the advanced amateur and the professional whose work requires a film size somewhat in excess of the 35mm. donble frame or emnlsions not supplied in that size. The Kodak Medalist is a compact miniature type hand camera for 2¼ x 3¼ roll film, cut sheet film, packs or plates. It is equipped with a new f/3.5 100mm. Ektar lens calibrated from f/3.5 to f/32 in Supermatic shutter with nine speeds, 1 to 1/400 second, precision focusing, coupled depth of field scale and range finder, and the features of double-exposure prevention, shutter winding in conjunction with film advance usu-

ally reserved for 35mm. cameras. Accessory backs for cut film and plates have been provided. Three copying or portrait lenses, the Kodak Portra Lens, Series VI, Nos. 1+, 2+ and 3+, may also be secured. Other accessories further increase the flexibility of the unit. As a universal field camera for scientific and research use involving the reproduction of specimens and possibly a limited amount of documentary reproduction, the Medalist offers intriguing prospects.

Microfilm Facilities at New York Historical Society

The New York Historical Society has recently acquired the Model D of the Micro-File Recordak machine together with the Model C Recordak Library Film Reader, so that its photographing department is now equipped to furnish photostats, photographs and microfilms. With its enlarging machine, it can furnish prints up to five feet in size.

It is recognized in the call for microfilms that this form of reproduction is preferred to photostat copies for study purposes, principally, of course, due to the difference in cost.

The Society has reproduced during the past twenty years, by the photostat process, most of the known copies of New York newspapers covering the period 1725-83, with the exception of the *New York Weekly Post Boy*, 1743-47, and the *New York Gazette and Weekly Post Boy*, 1747-73. The latter may be reproduced by microfilm since the subscribing libraries to the earlier series of photostats prefer it.

The newest process of reproduction, which has admirable qualities, is the microprint by which Sabin's bibliography has just been reproduced. When this process is further along, few libraries which have need of documentary reproduction will be able to get along without it, as it is the least costly of all. The society has acquired the microprint reader.

Microphotography in Occupied France

It is encouraging to note that even in present day France microphotography has survived and is being used for scientific and documentary research. M. Pierre Auger, the Director of the Service de Documentation du Centre de la Recherche Scientifique, with offices at 18 Rue Pierre Curie, Paris (V^{e}), announces that publication of the *Analytical Bulletin* has been resumed and arrangements have been made to supply microfilms of materials mentioned in the *Bulletin*, and in a general way of any kind of publications and books available to the Center. Those interested in obtaining materials of this type from

France may address the Director or M. L. Chereau at the address given above.

New Navy Records Office Established

A new office of Records Coordination has been established in the office of the Secretary of the Navy. The functions of this division will be the planning, coordinating and administration of systems, methods and procedures pertaining to organization, service, preservation, reduction, transfer and distribution of files and records of the Navy Department and its field offices. Among the immediate objectives is the provision of expert advice and assistance in the clearing of needed space by the transfer of valuable records to The National Archives and the prompt elimination of valueless records as provided by law, the segregation and elimination of records of transitory value as they accumulate and the withholding of nonrecord or surplus material from the files. The utilization of microphotography and other methods of document handling and control, in an expanded program, will be one of the prime objectives of the plan. Mr. Emmet J. Leahy, formerly an Associate Archivist on the staff of The National Archives has been appointed Director of the New Unit.

News from India

The planning committee of the Indian Library Association is now considering a project for the microfilming of all available past issues of Indian newspapers in the libraries of India. The matter will receive consideration at the next meeting of the All India Library Conference. It is being strongly supported by the University of Bombay, the Imperial Library, and other leading libraries. It is expected that American support will also be given.

Information has been recently received that the microfilming apparatus in the care of the Royal Asiatic Society of Bengal is now being used by the Government of India for defense purposes with the permission of its owner, the American Council of Learned Societies. This Government work, however, will not interfere with the cultural use of the apparatus as described in the March 1941 number of this JOURNAL. Government has also purchased all available microfilm equipment from Kodak Ltd. of India.

Pennsylvania Gazette

The Historical Society of Pennsylvania has completed a master microfilm negative of the *Pennsylvania Gazette* from December 24, 1728 to December 30, 1789. Originals in the possession of the Society were sup-

plemented by issues in other institutions and in every case the best available issue was selected for reproduction. Safety 35mm. double perforated film was used throughout and the entire file is contained on 21 reels of 100 feet each. Reels are separately boxed to facilitate cataloging. Positive prints are available to interested institutions and individuals at $125 per set. Correspondence should be addressed to the Society, 1300 Locust Street, Philadelphia, Pa.

S. V. E. Reading Machine

The portable reading machine described in a previous issue of the JOURNAL is now ready for distribution and deliveries are being made on orders. A product of the Society for Visual Education, the reader is officially known as the Microfilm Reader Model RM. It is, in brief, a 12-diameter, translucent screen, portable reading machine, suitable for either 35 or 16mm. film in short lengths or full 100-foot rolls. The price is $75. Complete information and an illustrated folder describing the unit may be obtained from the Society for Visual Education, 100 East Ohio Street, Chicago, Ill.

Southern Church History on Microfilm

The Texas Baptist General Convention through a standing Historical Committee is now using microphotography to preserve a small but important collection of early newspapers covering the religious history of the Southwest for the past hundred years. The principal collection is maintained in the Baptist Historical Library of which Mr. L. R. Elliott is the Librarian. Fragile and rare items are being microfilmed for preservation and accessions are being made in the form of microfilm copies. In addition to these activities the Southern Baptist Historical Society has appointed a Committee on Microfilming. A cooperative project of compiling a union list of Baptist periodicals in North America is now being organized. Those interested in participating in the plan are invited to communicate with Mr. L. R. Elliott, Southwestern Baptist Theological Seminary, Seminary Hill, Texas.

BOOK REVIEWS and NOTICES

DIRECTORY OF MICROFILM SOURCES INCLUDING PHOTOSTAT SERVICE, comp. by Ross C. Cibella. N.Y.: Special Libraries Association, 1941. 56p. 7 x 10 inches. offset from varityper script, paper, 75c.

In 1939 the Committee on Microfilming and Documentation of the Special Libraries Association began the compilation of a list of sources for microfilm through the issuance of a questionnaire. Considerable information was accumulated, and the lengthy process of reducing questionnaires to tabulated data began. The *Directory* is arranged in four sections: the first, containing 202 entries, lists library and scholarly centers possessing microfilm services, equipment or collections, photostatic or photographic facilities; the second lists 13 commercial sonrces of microfilm service or equipment; the third consists of some 30 pages in which sample order forms are reproduced in facsimile; the fourth, includes indexes and finding aids.

The *Directory* is not complete; no undertaking of this magnitude could ever be, for there are many changes and additions in this rapidly moving field. Some of the order forms reproduced have been altered or are no longer used. A detailed study of the order blanks, however, will yield considerable information and provide an insight into the practical operation of a microfilm service. The compilation is none the less important and is, in fact, almost indispensable for any large library. Mr. Cibella and his Committee deserve high praise for their work, and it is to be hoped that they will continue and issue a new and revised edition in the near future.

GUIDE TO LIBRARY FACILITIES FOR NATIONAL DEFENSE. rev. ed. edited by Carl L. Cannon for the Joint Committee on library research facilities for national emergency. Chicago: American Library Association, 1941. 448p. 8½ x 11 inches. offset from typescript, $1.25.

Almost double the size of the preliminary issue of the *Guide* (reviewed in the JOURNAL, Vol. IV, p.74-75), this revised edition is a far more useful tool than its predecessor. Approximately 250 libraries have been added to the original 500 to increase coverage, and numerous

changes have been made to facilitate ready reference. (For a detailed list of changes, see the Summary, p.407-11.) In several instances, the existence of facilities for documentary reproduction has been noted, but it is to be regretted that this important phase of library work did not receive more attention.

PHOTOGRAPHIC EMULSION TECHNIQUE, by T. Thorne Baker. Boston: American Photographic Publishing Company, 1941. 263p. 5½ x 7½ inches. illus. cloth, $4.

All books are needed more or less, but only infrequently does one appear that is timely, readable and packed with valuable information. All photographers and many others will welcome this modern study of emulsion making. The world is at war or preparing for war; priorities in photography are a grim reality; commercial companies are already restricting production of "special" or "service" sensitive materials. Coincidently photography is invading new fields and finding new applications with amazing rapidity. Development and research must keep pace and all research is not done in the laboratories of large manufacturing companies, in universities or institutions. Photography itself owes much of its existence to the efforts of experimenters. In America the experimenter of recent years has not been particularly attracted to the interesting and important field of emulsion making. There are many probable reasons: manufacturers supply at low prices almost innumerable grades and varieties of excellent film and paper; large scale users have been able to obtain special materials from manufacturers without difficulty; sensitive materials are manufactured on a production basis principally by a few large companies; and finally, there has been a great dearth of published material on the subject. Little beyond the 19th century studies of Eder and his contemporaries or the later works of Wall has been available except in the files of technical and trade periodicals; the task of assembling a bibliography alone is difficult and time-consuming.

The author has drawn upon his extensive experience to survey the entire field of emulsion making both from the viewpoint of the manufacturer and from that of the experimenter. The initial chapter on the nature of the photographic emulsion can be read profitably by any photographer. Materials and laboratory equipment receive detailed attention. The making of negative and positive, regular and color sensitive emulsions for coating on glass, film or paper are fully covered and include formulas and working directions. Special applications, as for example X-ray, ultraviolet and metallic processes are included. There is a chapter on the testing of emulsioned products and

another on extreme speed emulsions.

The book is clearly written for the use of the average worker without advanced technical training; and without sacrifice of scientific accuracy common names and readily understandable terms are used. References appearing at the conclusion of each chapter allow the discussion to he extended and supplemented. In some cases sources for proprietary chemicals are given. Charts, drawings, graphs and half-tone illustrations have been extensively used. There is a good index.

It remains to be seen how the present emergency will affect the supply of sensitive materials in the United States. Indications are that there will be further shortages, and that most large laboratories will specialize on research directly connected with the defense program. Scientists and experimenters may therefore find comfort in the thought that should the need arise, they may investigate the possibility of preparing their own materials. Moreover, as a thorough knowledge of his tools and materials is essential to the craftsman or artist, a knowledge of emulsions is almost mandatory for the photographer. Nowhere else can so much practical information on the subject be found in a single volume. It is without question one of the best photographic books of the year and should be added to tbe none too lengthy shelf of indispensable photographic reference works.

EDITOR'S CORNER

The Writers

Dr. L. Bendikson, an Associate Editor of the JOURNAL, is in charge of the Department of Photographic Reproduction of tbe Huntington Library, San Marino, California. Dr. Maurice F. Tauber is a Research Assistant in the Graduate Library School of the University of Chicago. The material appearing in his article will be extended in a volume entitled *The University Library* which he is writing in collaboration with Dean Louis R. Wilson of the University of Chicago Graduate Library School. Dr. Adele Kibre is a Research Assistant in the Department of the Humanities of the University of Chicago. Dr. Atherton Seidell of the United States Department of Public Health is the organizer of the Medicofilm Service of the Surgeon-General's Library and one of the pioneers in the application of microphotography to scientific research. Miss D. M. Litchfield of Columbia University Libraries with Dr. Mary A. Bennett has given the Columbia Summer Course in microphotography for the past three years. Mr. Donald C. Holmes is Chief Technician, the Photoduplication Service, Library of Congress. Mr. Frank W. Bobb is in charge of the microphotographic laboratories of the Historical Society of Pennsylvania, Philadelphia. Mr. Spencer Duty who lives in Wooster, Ohio, became interested in reflection copying in connection with a research project involving the reproduction of early land maps. He was assisted by the Committee on Private Research of Western Reserve University and the present article is a result of his experience.

A Letter to the Editor

Mr. L. W. Chilton, Editor of *Photographic Abstracts,* the valuable publication of the Royal Photographic Society of Great Britain, wrote on August 18, 1941 as follows:

I was interested to note on page 80 of the March number of the JOURNAL OF DOCUMENTARY REPRODUCTION your discussion of the old question of nomenclature, 'Microphotography' v. 'photomicrography'. You will be glad to learn that the English practice is the same as the American in this matter so that at least the English-speaking world is in agreement on the matter. I like your suggestion of 'photomacrography' for moderately enlarged photographs of small objects; this has not yet come into use

in this country, but I will do what I can to introduce the use of this term.

May I take this opportunity of saying what a splendid addition to photographic literature your journal has become. It serves a most important branch of the subject, and serves it well.

May I also ask that you invite authors of papers in this field to send preprints or reprints of their papers to me so that they may be abstracted at an early date in *Photographic Abstracts*. War or no war, we are doing our best to carry on publication, and the abstract journal still finds its way into the principal libraries of the world.

With every good wish for the continued progress of your journal, I am, Yours sincerely, (sigued) *L. W. Chilton.*

The stupendous and successful efforts being made by English scholars and scientists to continue their work in the face of great obstacles have aroused the admiration of their colleagues and friends in the United States, and the Editor wishes to encourage all workers in this field who publish the results of their work in this and other journals to comply with the request and forward all material to Mr. Chilton at 16 Prince's Gate, London, S.W. 7.

Change of Address

The Editorial office of the JOURNAL formerly located at 808 Beverly Drive, Alexandria, Va., has been changed and in the future all communications should be addressed to 1502 Russell Road, Alexandria, Va., or to Post Office Box 622, Franklin Station, Washington, D.C.

Microphotography in a Program of Library Cooperation

In an effort to formulate a plan for library cooperation on all fronts, Mr. Archibald MacLeish, Librarian of Congress recently appointed Dr. Herbert A. Kellar as the Director, Experimental Division of Library Cooperation. A series of memoranda addressed to librarians, scholars, administrators and others interested in library cooperation have been compiled and given limited distribution. Memorandum III "Documentary Reproduction" deals entirely with matters of interest to the readers of the JOURNAL, and in an effort to bring the discussion to the attention of many who might otherwise not see it, it is printed herewith in substantially complete form. Readers are urged to communicate their reactions to Dr. Kellar at the Library of Congress, for the memoranda are purely suggestive and all available information is desired for use in formulating a definite plan.

MEMORANDUM III

DOCUMENTARY REPRODUCTION

I. *Present Situation*

Within the last decade a revolutionary range of new techniques—inexpensive methods of publishing and

reproducing research materials and the products of research—has appeared on the academic horizon and bids fair to starting a new day for scholarship.

Microphotography has come to the fore to answer the question of how to reproduce vast bodies of source materials in a few copies only at relatively low costs.[1] It has heen the means of reproducing out-of-print and unique materials for research purposes; it has been a substitute in many cases for interlibrary loan, relieving libraries of this burden and saving scholars thousands of dollars in travel when materials, for one reason or another, could not be mailed about the country. In the present international crisis, it is the bridge whereby copies of valuable research materials are being conveyed to this country from Europe. It is playing an important role in preservation and storage.

More recently, microprint has entered the picture, being more inexpensive than microfilm where somewhat larger editions of long runs of materials are required. It is the method being used at present in the reproduction of the British Sessional Papers of the nineteenth century.

In addition to these two methods, especially useful in the copying of large bodies of materials—the one for single copies or a few copies only, the other for somewhat larger editions—there is a myriad of techniques—hectograph, mimeograph, multilith, photostat, Ozalid, photo-offset—lending themselves to the needs of scholarship, from the reproduction in a single copy of a small item to the producing in hundreds of a large one. Above the 2000 mark, commercial printing comes into the picture.

These methods serve not only to reproduce materials already in existence but needing additional copying, but are in themselves mediums for original publication, opening a bottleneck that has held back scholarship for centuries. With the trend towards more and more specialized research, the feasibility of commercially-successful printed publication decreases commensurately. Printing as we know it is geared to a market where many hundreds and thousands of people all want to read the same thing; the specialized products of research cannot hope to interest this market. With subsidies for scholarly publication steadily dwindling, the scholar finds himself turning more and more (unfortunately in a reluctant manner, since the fetish of form rather than of content is still strong in the academic world) towards those techniques that offer him a way to give to the other researchers in his field—be they one, a score, or a hundred—the results of his work.

All these factors are on the good side of the ledger. But new opportunities carry with them new responsibilities, and there are many problems that accompany the advance in technical processes. Most of them head up in some form of control.

II. *Current Problems*

A. One of the most obvious problems is to make the scholarly and library world acquainted with

[1] The Joint Committee on Materials for Research, under the leadership of Robert C. Binkley, pioneered in this field. It filmed the NRA and AAA hearings at a cost of $443 per joint set per library, whereas hectograph and mimeograph copies would have cost $5720 per joint set per library, and commercial printing was equally out of the question.

these new developments and to teach it to choose the appropriate technique for each case. An impartial body or organization is needed to fulfill this function (which the Joint Committee filled during its lifetime). Microphotography has become a well-known device, for instance, but it is not a panacea and is often not the most appropriate method to be used. Its place in the scale, as well as that of the other methods, should be defined, evaluated, and made known.

B. Once these techniques are widely known in the academic world, it will be necessary to have some committee or body keep informed of new developments and in turn make this information available to others. Impartial information about new equipment, bad points as well as good, will also need to be made available.

C. A center of exchange for the various short cuts worked out by persons engaged in these new techniques would be valuable. For instance, the method of the University of Chicago for making detachable leaders for film strips by using draftsmen's crepe paper scotch tape which can be removed when the print has been made is a time-saving device which is known to others only through accident or incident.

D. A number of concrete cases have recently demonstrated the need for objective standards of quality, devised in agreement by a group of competent impartial technicians, and freely made available. Too many libraries are paying for inferior work; too many grants are being expended for low quality production; and too many individual scholars are wasting time, labor, money, and materials because they have no place to turn for practical advice.

E. Within each technique there is usually a way of work that is at once more desirable and more economical. For instance, in photo-offset work the major secret of price lies in the proper format. Not knowing this, many persons pay prices almost equal to those of regular printing. An information center on such pointers would be useful.

F. Much discussion has taken place concerning the proper way to catalog the products of the new techniques. Some synthesis of the best of the thoughts advanced should be made and put into effect.

G. The many problems that accompany miniature reproduction—storage, identification, handling, etc.—need to be worked out, possibly through experimentation, and the information disseminated.

H. A study of legibility and eyestrain in connection with these methods needs to be made. An answer is needed to the question of whether it is better to use positive copies or diazo duplicate negatives in research work from the standpoint of eye ease. Time and cost studies are essential to determine when to retain the negative rather than to refilm, and how to pro-rate the cost of the negative in a potential market.

I. Such questions as the effect of bombing on film should be studied.

J. A center is needed for servicing Ozalid, B-W, and blueprint reproductions on a copy-to-order basis.

K. Thought should be given to the question of whether two copies of all rare materials that have been filmed should be made and deposited in different parts of the country for safe keeping, and if so, how the costs of the films should be pro-rated.

L. A center to which new ideas might come and from which requests to experiment with these ideas might go would be a valuable adjunct.

M. This same center could encourage a union catalog of film holdings. Cards for copies of printed items might be filed in the national Union Catalog; those for copies of manuscript items could be placed in the Union Catalog of Manuscripts (see the discussion on this in the section on Union Catalogs.

N. Much film material of good quality, now in private hands, could be transferred to libraries and thus be made available to scholarship generally. A concerted effort is needed in this direction.

O. As the amount of filming increases, the question arises as to the desirability of a central depository where negatives could be stored and serviced.

P. Experience has demonstrated the desirability at times of making a negative and two positives, the negative to be kept for preservation, one positive to be used for reference on the ground, and the other for lending purposes. Some thought should be given to the question of when lending of an extra positive, rather than purchase or refilming, is desirable.

Q. Study should be given to the possibility and desirability of interlibrary lending of film copies and to the problems related.

R. There is a great need for library cooperation in planning and financing large filming projects. With the new techniques, libraries can actively institute plans to film or otherwise make available certain desired materials, instead of waiting for reprinting or new publication. This must, however, be kept under control.

S. Cooperation of libraries might be enlisted to film a prescribed part of their holdings, to preserve a well-rounded record of civilization for the future.

T. "If a circle of twenty libraries should each organize and within its present budget each should shift a small percentage from the purchase of more texts on paper to the transfer of some of its unique holdings from paper to film and should agree to a mutuality of borrowing and lending, the resulting enrichment would be direct and immediate and the long-term effect would reach beyond the field of librarianship." This ideal, as stated by Robert C. Binkley, might receive practical testing under the leadership of a central organization.

U. The question of copyright in connection with the use of these new techniques, is a delicate problem and one of considerable importance. It is essential to have principles defined which will not damage the interests of the holders of copyright but at the same time will not unduly restrict the freedom of communication so vital to scholarship. A most important role could be played by an organization which would act as a vanguard and hold the front line of copyright while sound policies of practice were being laid down.

III. *The Council on Documentary Reproduction*

At the June meeting of the American Library Association in Boston, a group of persons interested in the problems stated in Section II met together to discuss the possibility of establishing a Council on Documentary Reproduction. Those present included Herman Fussler, Head of the Department of Photographic Reproduction at the University of Chicago; Eugene Power, Director of University Microfilms at Ann Arbor; Vernon Tate, Chief of the Division of Photographic Reproduction and Research at The National Archives; Albert Boni, President of the Readex Microprint Corporation; George Schwegmann, Chief of the Division of Photoduplication at the Library of Congress; Eugene Tilleux of the Work Projects Administration; Herbert Kellar, Director, and Adeline Barry, Executive Secretary, of the Experimental Division of Library Cooperation at the Library of Congress.

An executive board was appointed, to consist of Messrs. Schwegmann, Tate, and Kellar, the last-named to be chairman. This board was charged with the drafting of a statement of objectives and a plan of organization. The Council was conceived of as being completely informal, the only prerequisite for participation being interest and willingness to cooperate. Subsequently, Julian Boyd, Librarian of Princeton University, and others have expressed a desire to be members of and to be associated with the Council.

It was felt at the time that the Experimental Division of Library Cooperation might well be the sponsor of such a group, but no formal steps were taken to implement this point of view. It is now proposed that the Experimental Division sponsor the Council on Documentary Reproduction and through it attempt to cope with the problems stated above. Obviously, it will be necessary to solicit cooperative efforts, but the soundings which have already been made indicate that these will be forthcoming. A half dozen first-rate film laboratories have offered their services; key librarians are anxious to see the administrative side of documentary reproduction brought under control; and scholars are keenly aware of how much it is to their benefit to cooperate.—HERBERT A. KELLAR.